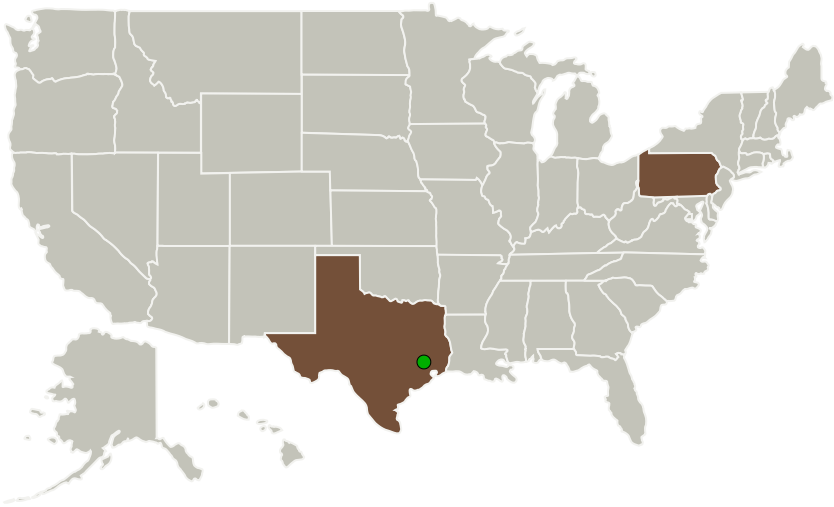
Individualized Stress Detection System, Phase I

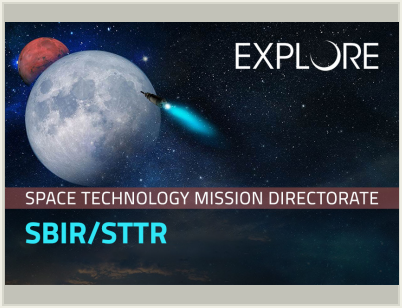
Completed Technology Project (2011 - 2011)

Project Introduction

Given the extended duration of future missions and the isolated, extreme and confined environments, there is the possibility that stress-related behavioral conditions and mental disorders (DSM-IV-TR) will develop. The overarching goal of this project is to deliver an integrated system that will track physiological signals (heart rate and heart rate variability) and behavioral signals (sleep wake patterns) to detect chronic stress, hyperarousal, and insomnia during space missions. This project will deliver both the sensor hardware and signal processing software needed for the real-time data collection and integration with other behavioral health monitoring systems (e.g., Individualized Behavioral Health Monitoring Tool). The result of this project through Phase II will be a system that can be deployed in space analog environments for validation testing and ultimately deployed on ISS to assist astronauts and mission support personnel in the detection of astronaut chronic stress, hyperarousal, and insomnia. The critical need for an Individualized Stress Detection System has been identified as a priority outlined in the BHP IRP Gap BMED3. During Phase I, we will perform an assessment of heart rate sensor and actigraphy technologies and develop engineering requirements and detailed technical plans to be implemented during Phase II (Phase I TRL of 3).

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Pulsar Informatics Inc	Lead Organization	Industry	
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Pennsylvania	Texas

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140221)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Pulsar Informatics Inc

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Daniel Mollicone

Co-Investigator:

Daniel Mollicone

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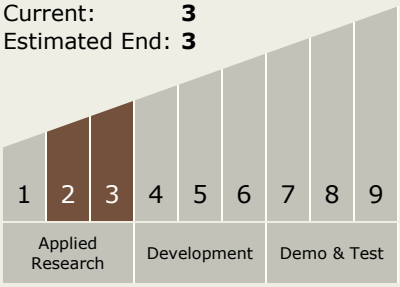
Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.3 Behavioral Health and Performance

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System